

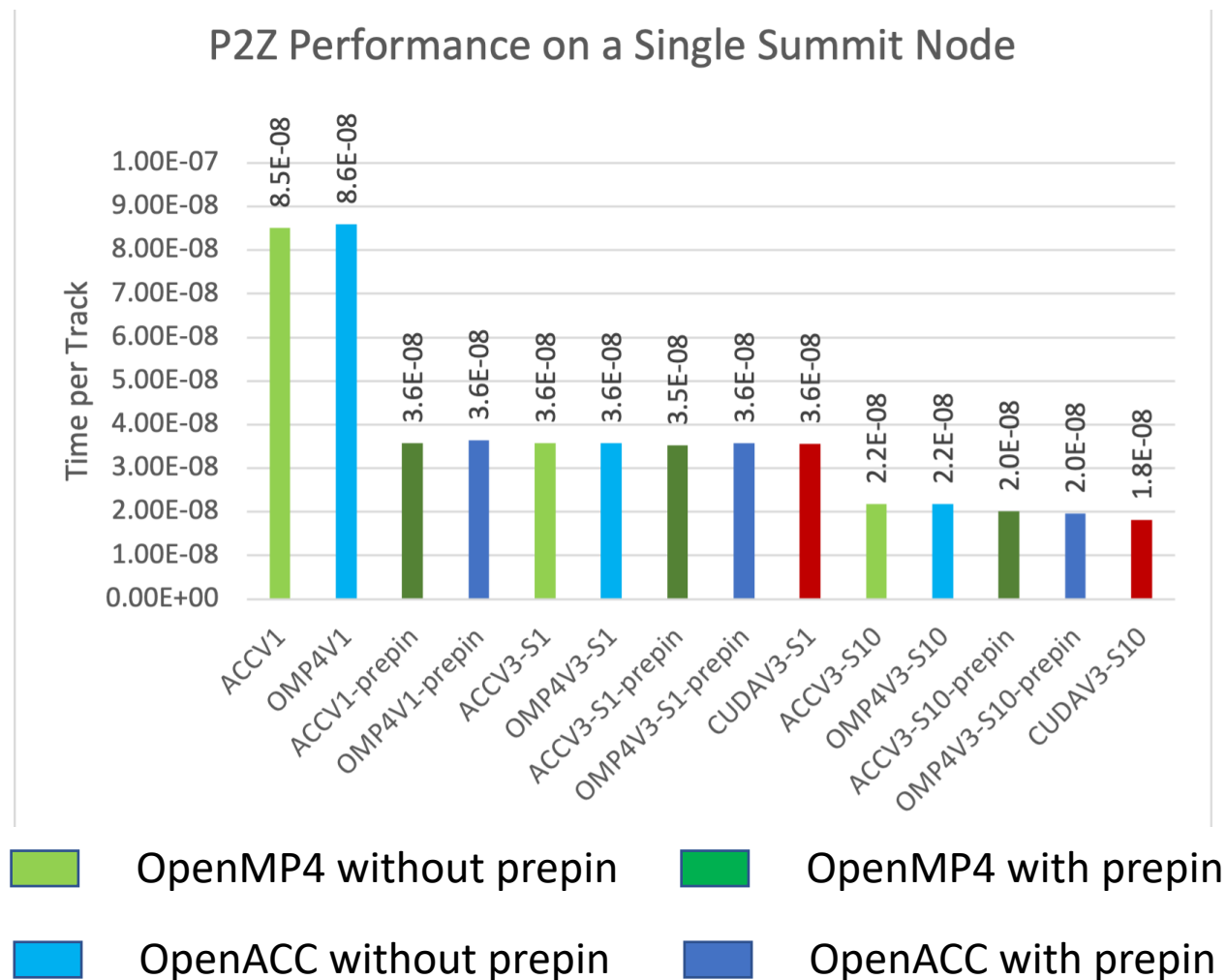
# OpenACC vs. OpenMP4 P2Z Performance Comparison

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# P2Z Performance: OpenACC, OpenMP4, and CUDA Performance on a Summit Node



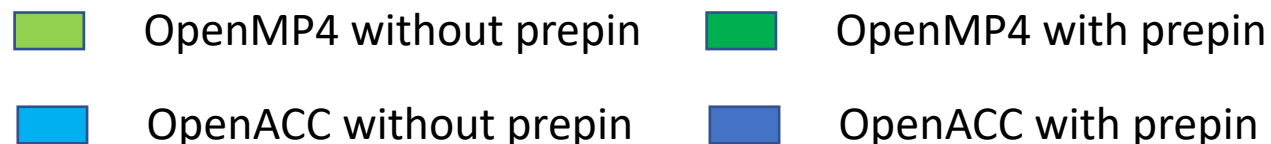
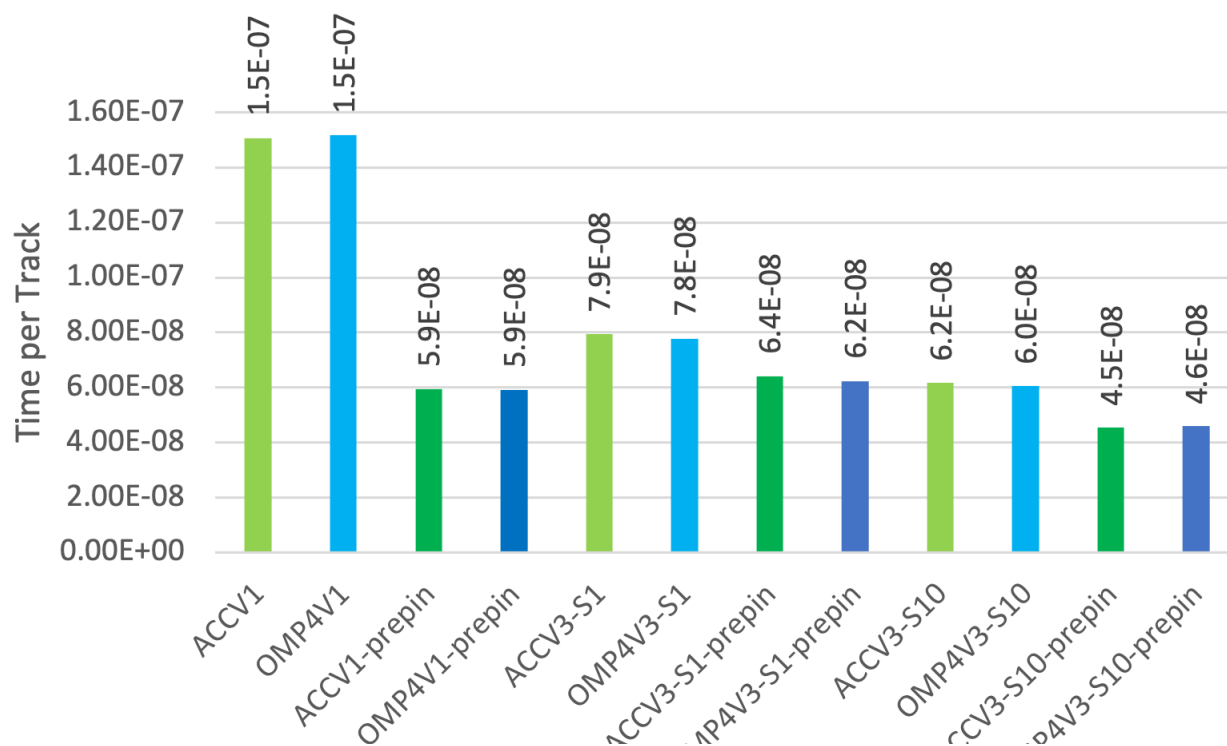
- **ACCV1**: OpenACC Version 1 – Synchronous
- **OMP4V1**: OpenMP4 Version 1 – Synchronous
- **ACCV1-prepin**: OpenACC Version 1 – Synchronous & prepinning host memory
- **OMP4V1-prepin**: OpenMP4 Version 1 – Synchronous & prepinning host memory
- **ACCV3-S1**: OpenACC Version 3 – Asynchronous with 1 stream
- **OMP4V3-S1**: OpenMP4 Version 3 – Asynchronous with 1 stream
- **ACCV3-S1-prepin**: OpenACC Version 3 – Asynchronous with 1 stream & prepinning host memory
- **OMP4V3-S1-prepin**: OpenMP4 Version 3 – Asynchronous with 1 stream & prepinning host memory
- **CUDAV3-S1**: CUDA Version 3 – Asynchronous with 1 stream
- **ACCV3-S10**: OpenACC Version 3 – Asynchronous with 10 streams
- **OMP4V3-S10**: OpenMP4 Version 3 – Asynchronous with 10 streams
- **ACCV3-S10-prepin**: OpenACC Version 3 – Asynchronous with 10 streams & prepinning host memory
- **OMP4V3-S10-prepin**: OpenMP4 Version 3 – Asynchronous with 10 streams & prepinning host memory
- **CUDAV3-S10**: CUDA Version 3 – Asynchronous with 10 streams

**V1**: Sync version

**V3**: Async version

# P2Z Performance: OpenACC vs. OpenMP4 Performance on a Pre-Frontier Node

(AMD EPIC 7272 CPU & AMD Instinct MI100 GPU)



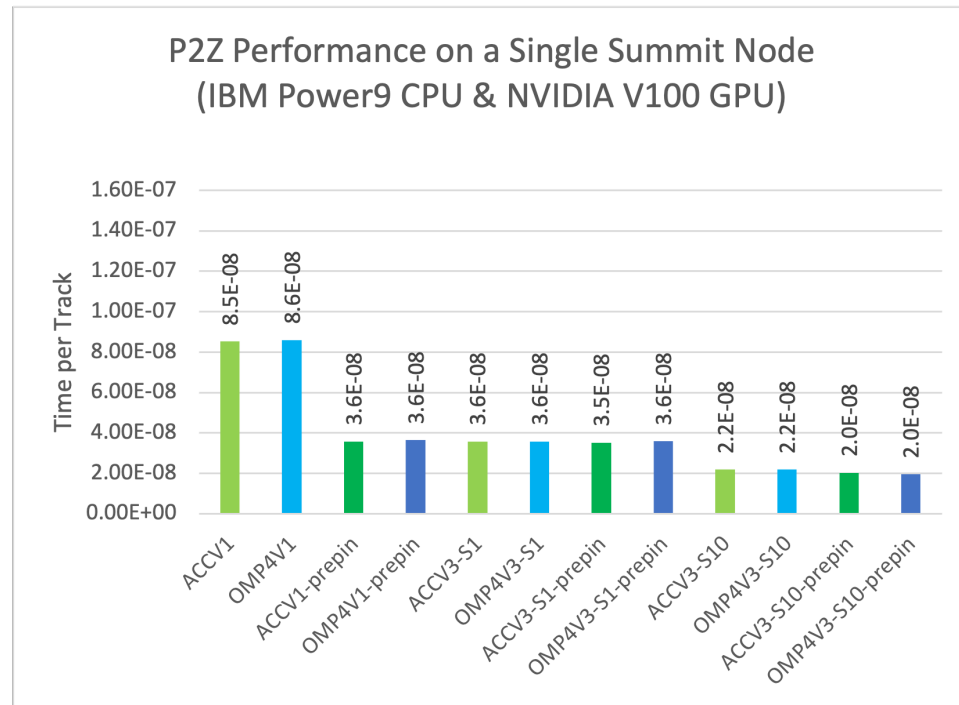
- **ACCV1**: OpenACC Version 1 – Synchronous
- **OMP4V1**: OpenMP4 Version 1 – Synchronous
- **ACCV1-prepin**: OpenACC Version 1 – Synchronous & prepinned host memory
- **OMP4V1-prepin**: OpenMP4 Version 1 – Synchronous & prepinned host memory
- **ACCV3-S1**: OpenACC Version 3 – Asynchronous with 1 stream
- **OMP4V3-S1**: OpenMP4 Version 3 – Asynchronous with 1 stream
- **ACCV3-S1-prepin**: OpenACC Version 3 – Asynchronous with 1 stream & prepinned host memory
- **OMP4V3-S1-prepin**: OpenMP4 Version 3 – Asynchronous with 1 stream & prepinned host memory
- **CUDA V3-S1**: CUDA Version 3 – Asynchronous with 1 stream
- **ACCV3-S10**: OpenACC Version 3 – Asynchronous with 10 streams
- **OMP4V3-S10**: OpenMP4 Version 3 – Asynchronous with 10 streams
- **ACCV3-S10-prepin**: OpenACC Version 3 – Asynchronous with 10 streams & prepinned host memory
- **OMP4V3-S10-prepin**: OpenMP4 Version 3 – Asynchronous with 10 streams & prepinned host memory
- **CUDA V3-S10**: CUDA Version 3 – Asynchronous with 10 streams

**V1**: Sync version

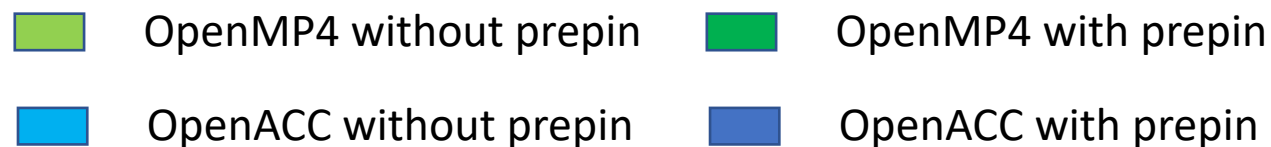
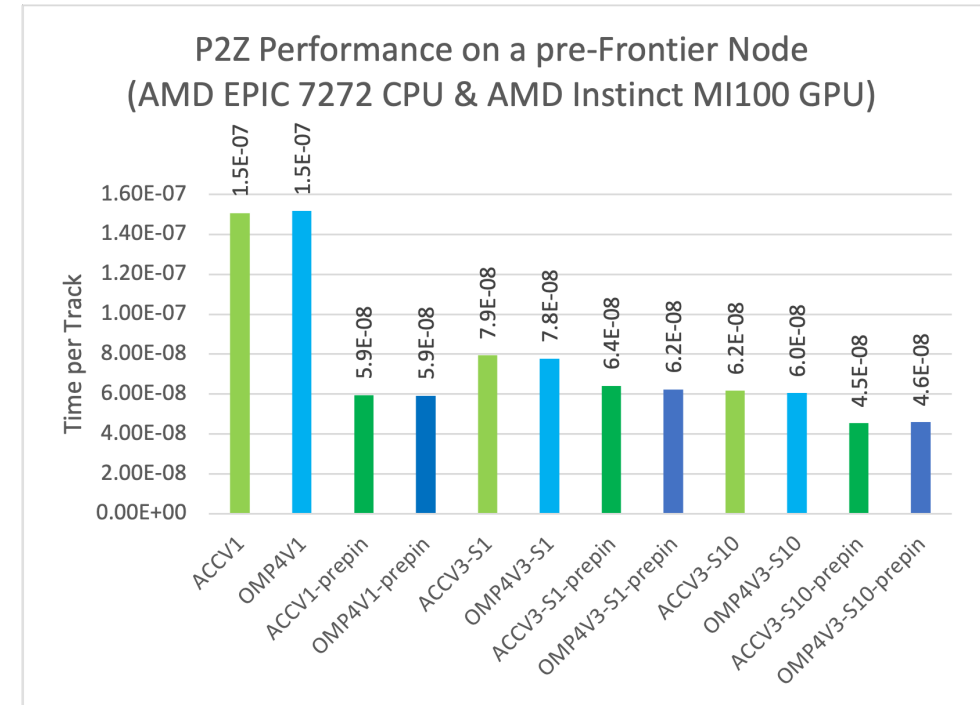
**V3**: Async version

# P2Z Performance: NVIDIA V100 vs. AMD MI100

V100 Peak FP32 Performance: 15.7 TFLOPs



MI100 Peak FP32 Performance: 23.1 TFLOPs



**V1:** Sync version

**V3:** Async version